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A strategic task assigned to large-scale transport models is to forecast the demand for transport over long periods of time to assess transport projects. However, by modelling complex systems transport models have an inherent uncertainty which increases over time. As a consequence, the longer the period forecasted the less reliable is the forecasted model output. Describing uncertainty propagation patterns over time is therefore important in order to provide complete information to the decision makers. Among the existing literature only few studies analyze uncertainty propagation patterns over time, especially with respect to large-scale transport models. The study described in this paper contributes to fill the gap by investigating the effects of uncertainty in socio-economic variables growth rate projections on large-scale transport model forecasts, using the Danish National Transport Model as a case study. Population, gross domestic product, employment, and fuel prices were analyzed to quantify their uncertainty for 5 year intervals over a period of 15 years. The output of this procedure was then used to implement model sensitivity tests. The results from the model sensitivity tests showed how the model output uncertainty grows over time, reflecting the increase in the uncertainty of the model variables. Furthermore, the resulting uncertainty temporal pattern was neither linear nor similar for the different model outputs investigated. This highlights the importance of investigating uncertainty for different model outputs, and also that a dynamic approach is required whenever the model has to provide mid-long time period forecasts.

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